

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

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# Review #1

## Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. (1 point) The common difference in the arithmetic sequence  $\frac{1}{2}, \frac{5}{6}, \frac{7}{6}, \frac{3}{2}, \frac{11}{6}, \dots$  is

A  $\frac{5}{12}$

B 3

C 9

D  $\frac{1}{3}$

$\frac{5}{6} - \frac{1}{2} =$

2. (1 point) What is the 18th term of the sequence -22, -21.2, -20.4, -19.6, -18.8, ...?

A -6.8

B 0.8

C -8.4

D -35.6

$d = 0.8$

$t_{18} = -22 + (17)(0.8)$

3. (1 point) The sum of the series  $(-5) + (-7) + (-9) + \dots + (-19)$  is

A -96

B -304

C -192

D 26

$-19 = -5 + (n-1)(-2)$   
 $n = 8$

$S_8 = 4(-5 + -19)$

4. (1 point) On the first day of the month, Michael places 5¢ in a jar. The next day, he places 7¢ in the jar. The third day, he places 9¢ in the jar, and so on for 24 days. What amount will be in the jar at the end of this period of time?

A \$6.72

B \$6.36

C \$6.96

D \$6.12

$S_{24} = 12(5(2) + 23(2))$

5. (1 point) The eighth term in the sequence 3 515 625 703 125 140 625 28 125, ... is

A 9

B  $\frac{1}{9}$

C 45

D 5

$r = 0.2$

$t_8 = 3515625(0.2)^7$

6. (1 point) How many terms are in the sequence 2, 8, 32, 128, 512, ..., 2 097 152?

A 9

B 12

C 10

D 1

$2097152 = 2(4)^{n-1}$   
 $1048576 = 4^{n-1}$

$n-1 = 10$

$n = 11$

7. (1 point) The sum of an infinite geometric series is  $\frac{20}{3}$  and its common ratio is  $\frac{1}{4}$ . What is the first term of the series?

A  $\frac{1}{4}$

B

C  $\frac{80}{3}$

D  $\frac{5}{3}$

$S_{\infty} = \frac{20}{3} = \frac{a}{1-\frac{1}{4}}$

8. (1 point) What are the three other angles in standard position that have a reference angle of 54°?

A 99°, 144°, 234°

B 108°, 162°, 216°

C 144°, 234°, 324°

D 126°, 234°, 306°

$180 - 54$   
 $180 + 54$   
 $360 - 54$

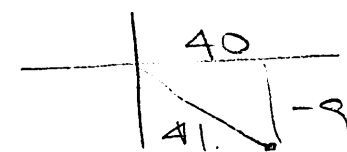
9. (1 point) The point (40, -9) is on the terminal arm of  $\angle A$ . Which is the set of exact primary trigonometric ratios for the angle?

A  $\sin A = -\frac{41}{9}$ ,  $\cos A = \frac{41}{40}$ ,  $\tan A = -\frac{9}{40}$

B  $\sin A = \frac{40}{41}$ ,  $\cos A = -\frac{9}{41}$ ,  $\tan A = -\frac{40}{9}$

C  $\sin A = -\frac{40}{41}$ ,  $\cos A = \frac{9}{41}$ ,  $\tan A = -\frac{9}{40}$

D  $\sin A = -\frac{9}{41}$ ,  $\cos A = \frac{40}{41}$ ,  $\tan A = -\frac{9}{40}$



10. (1 point) What is the exact value for  $\tan(240^\circ)$ ?

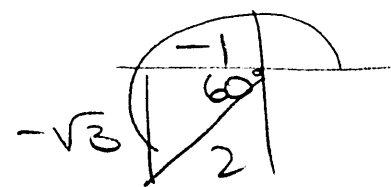
A  $\frac{1}{\sqrt{3}}$

B  $-\sqrt{3}$

C 1

D  $\sqrt{3}$

$= -\frac{\sqrt{3}}{1} = -\sqrt{3}$



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- B 11. (1 point) Determine the length of  $x$ , to the nearest tenth of a centimetre.

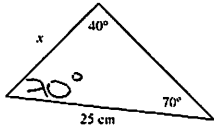


Diagram not drawn to scale

$$\frac{\sin 70}{x} = \frac{\sin 40}{25}$$

- A 26.6  
☒ B 36.5

- C 11.2  
 D 17.1

- B 12. (1 point) Determine, to the nearest tenth of a centimetre, the two possible lengths of  $a$ .

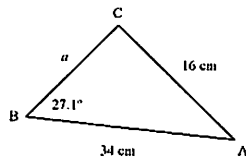


Diagram not drawn to scale

$$\frac{\sin 27.1}{16} = \frac{\sin C}{34}$$

$$\angle C_1 = 75.5 \quad \angle A_1 = 77.4$$

$$\angle C_2 = 104.5 \quad \angle A_2 = 48.4$$

- ☒ A 72.8 cm and 26.3 cm  
☐ B 84.3 cm and 26.3 cm

- ☒ C 72.8 cm and 55.8 cm  
 D 55.8 cm and 34.3 cm

$$\frac{\sin 77.4}{a_1} = \frac{\sin 27.1}{16} \quad a_1 = 34.3$$

$$\frac{\sin 48.4}{a_2} = \frac{\sin 27.1}{16} \quad a_2 = 26.3$$

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- B 13. (1 point) Determine the measure of  $x$ , to the nearest tenth of a degree.

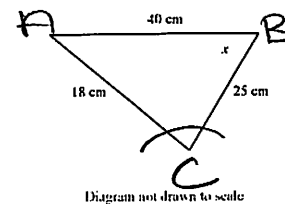


Diagram not drawn to scale

$$40^2 = 18^2 + 25^2 - 2(18)(25) \cos C$$

$$\angle C = 136.3^\circ$$

$$\frac{\sin B}{18} = \frac{\sin 136.3}{40}$$

- A 25.6°  
☒ B 38.1°

- C 136.3°  
 D 71.9°

- C 14. (1 point) What is the length of  $x$ , to the nearest tenth of a metre?

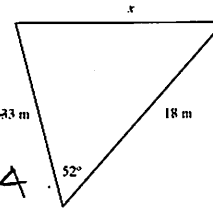


Diagram not drawn to scale

$$x^2 = 33^2 + 18^2 - 2(33)(18) \cos 52$$

$$x = 26.1$$

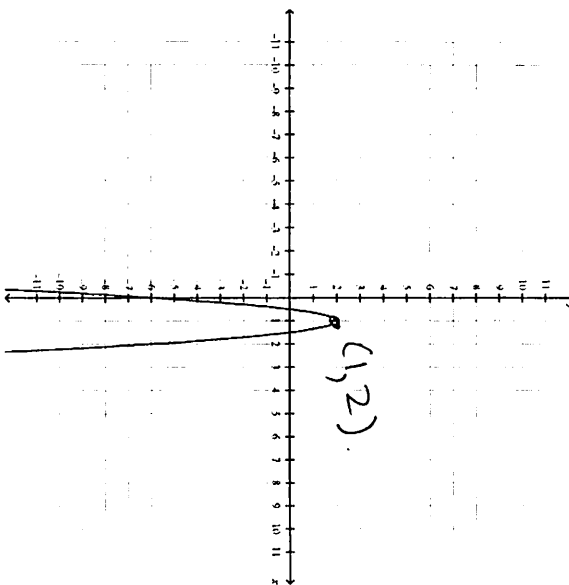
- A 27.7 m  
 B 21.8 m

- ☒ C 26.1 m  
 D 37.6 m

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15. (1 point) What is the quadratic function in vertex form for the parabola shown below?



- ☐ A  $f(x) = -8(x-2)^2 + 1$   
☒ B  $f(x) = -8(x-1)^2 + 2$   
☐ C  $f(x) = 8(x+1)^2 + 1$   
☐ D  $f(x) = 8(x-1)^2 - 2$

16. (1 point) What are the domain and range of  $y = 7(x-1)^2 - 9$ ?

- ☐ A Domain:  $\{x|x \leq -1, x \in R\}$   
 Range:  $\{y|y \in R\}$   
☒ B Domain:  $\{x|x \in R\}$   
 Range:  $\{y|y \geq -9, y \in R\}$   
☐ C Domain:  $\{x|x \geq 7, x \in R\}$   
 Range:  $\{y|y \in R\}$   
☐ D Domain:  $\{x|x \in R\}$   
 Range:  $\{y|y \leq -1, y \in R\}$

$R: y \geq -9$

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17. (1 point) The vertex of a parabola is located at  $(-5, 6)$ . If the parabola has a y-intercept of 231, which quadratic function represents the parabola?

- ☒ A  $f(x) = 9(x-5)^2 + 6$   
☐ B  $f(x) = 9(x+5)^2 + 6$   
☐ C  $f(x) = -9(x+5)^2 + 6$   
☐ D  $f(x) = 9(x-5)^2 - 6$

18. (1 point) What are the coordinates of the vertex of the quadratic function  $y = 4x^2 + 8x - 2$ ?

- ☐ A  $(-6, -1)$   
☐ B  $(8, -2)$

- ☒ C  $(-1, -6)$   
☐ D  $(8, -6)$

19. (1 point) Which quadratic function in standard form represents  $y = 3(x-1)^2 - 25$ ?

- ☒ A  $y = 3x^2 - 3x - 11$   
☐ B  $y = 3x^2 - 6x - 22$

- ☐ C  $y = 3x^2 + 6x - 22$   
☐ D  $y = 3x^2 - 6x - 11$

20. (1 point) State whether the function  $y = 4x^2 - 36x + 43$  has a maximum or minimum value and identify the coordinates of the vertex.

- ☒ A maximum at  $(4.5, -124)$   
☐ B maximum at  $(-124, 4.5)$

- ☐ C minimum at  $(-124, 4.5)$   
☒ D minimum at  $(4.5, -124)$

21. (1 point) What is the vertex form of  $y = (1/4)x^2 + (1/16)x - 1/64$ ?

- ☐ A  $\frac{1}{4}(x + 1/8)^2 + \frac{5}{256}$   
☐ B  $\frac{1}{4}(x - 5/256)^2 - 1/8$

- ☐ C  $\frac{1}{4}(x + 5/256)^2 + 1/8$   
☒ D  $\frac{1}{4}(x + 1/8)^2 - 5/256$

22. (1 point) What are the roots of the quadratic function  $y = 0.5x^2 + 3.5x + 6$ ?

- ☐ A  $-0.125$   
☐ B  $4$  and  $3$

- ☒ C  $4$  and  $-3$   
☐ D  $5$  and  $6$

$231 = a(b+5)^2 + 6$

$a = 9$

$(0, 231)$

$y = 3(x^2 - 2x + 1) - 25$

$V(-1, -6)$

$y = 4(x^2 - 9x + 20.25 - 20.25) = 4x^2 - 36x + 43$

$y = 4(x - 4.5)^2 - 81$

$y = 4(x - 4.5)^2 - 124$

$y = 5x^2 + 35x + 60$

$y = x^2 + 7x + 12$

$y = (x + 4)(x + 3)$

$y = \frac{1}{4}(x^2 + \frac{1}{2}x + \frac{1}{64} - \frac{1}{64}) - \frac{1}{64}$

$y = \frac{1}{4}(x + \frac{1}{8})^2 - \frac{1}{4} - \frac{1}{64}$

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23. (1 point) What are the roots of the quadratic function  $y = -6.1x^2 - 97.6x - 390.4$ ?

A -8 and 0  
B -390.4 and 8

C -8  
D 8

$$x = \frac{-97.6 \pm \sqrt{97.6^2 - 4(-6.1)(-390.4)}}{2(-6.1)}$$

24. (1 point) Determine the roots of the quadratic equation  $144x^2 - 324 = 0$ .

A  $x = \frac{4}{9}$  and  $x = -\frac{4}{9}$

C  $x = \frac{9}{4}$  and  $x = -\frac{9}{4}$

B  $x = \frac{3}{2}$  and  $x = -\frac{3}{2}$

D  $x = \frac{2}{3}$  and  $x = -\frac{2}{3}$

$$x^2 = \frac{324}{144} = \frac{9}{4}$$

$$x = \pm \sqrt{\frac{9}{4}}$$

25. (1 point) A rectangle has dimensions  $x+10$  and  $5x-4$ , where  $x$  is in centimetres. If the area of the rectangle is  $72 \text{ cm}^2$ , what is the value of  $x$ , to the nearest tenth of a centimetre?

$x+10$

$5x-4$



$$(x+10)(5x-4) = 72$$

$$5x^2 + 46x - 112 = 0$$

$$x = \frac{-46 \pm \sqrt{46^2 - 4(5)(-112)}}{2(5)}$$

$$x = \frac{-46 \pm \sqrt{4356}}{10}$$

A  $x = 2.0$   
B  $x = -4.6$

C  $x = 11.2$   
D  $x = -11.2$

$$x = \frac{-8 \pm \sqrt{64 - 4(-2504)}}{2}$$

$$x = 46.2$$

$$x^2 + 8x - 2504 = 0$$

$$x(x+8) = 2504$$

26. (1 point) A rectangle with an area of  $2504 \text{ cm}^2$  is  $x$  centimetres wide and  $(x+8)$  centimetres long. To the nearest tenth of a centimetre, the width and length are

A 50.0 cm and 50.0 cm  
B -46.2 cm and -54.2 cm

C 46.2 cm and 54.2 cm  
D -14.0 cm and 114.0 cm

$$W = 46.2$$

$$L = 54.2$$

27. (1 point) When Alex rides his dirt bike off a ramp, his path can be modelled by  $h(d) = -3.9d^2 + 13.1d + 8.7$ , where  $d$  is the horizontal distance from the ramp and  $h$  is the height, both in metres. How far away from the ramp does he land, to the nearest tenth of a metre?

A 2.0 m  
B 0.6 m

C 7.9 m  
D 3.9 m

$$d = \frac{-13.1 \pm \sqrt{13.1^2 - 4(-3.9)(8.7)}}{2(-3.9)}$$

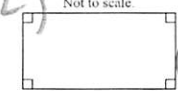
28. (1 point) The number of real roots for the equation  $y = -30.6x^2 + 30.7x - 39.8$  is

A 2  
B 0

C 1  
D impossible to tell

$$30.7^2 - 4(-30.6)(-39.8) < 0$$

29. (1 point) Find a simplified expression for the perimeter of this shape.



$$2(7\sqrt{5} - 2\sqrt{6})$$

A  $44\sqrt{5} - 8\sqrt{6} - 32$   
B  $22\sqrt{5} - 4\sqrt{6} - 16$

C  $12\sqrt{2} + 4\sqrt{3} + 4$   
D  $4\sqrt{6} + \sqrt{3} - 8 - \sqrt{2}$

$$8\sqrt{5} - 16 + 14\sqrt{5} - 4\sqrt{6}$$

30. (1 point) Express  $\sqrt[5]{64n^{10}m^{15}}$  in simplified form.

A  $4n^2m^3(\sqrt[5]{4})$

C  $4n^2m^3(\sqrt[5]{2})$

B  $2n^3m^2(\sqrt[5]{5})$

D  $2n^2m^3(\sqrt[5]{2})$

$$\sqrt[5]{2^5 \cdot 2 \cdot n^{10} \cdot m^{15}} = 2n^2m^3\sqrt[5]{2}$$

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$$\frac{5}{6}(\sqrt[3]{6})^3 + 3\sqrt[3]{5} = \frac{5}{6} \sqrt[3]{216 \cdot 5} + \sqrt[3]{27 \cdot 5}$$

31. (1 point) Simplify the expression  $\frac{6}{5}(\sqrt[3]{1080}) + \frac{8}{\sqrt[3]{15}}$

- A  $\frac{43}{5}(\sqrt{5})$   
 B  $\frac{24}{23}(\sqrt{6})$   
 C  $\frac{48}{5}(\sqrt{5})$   
 D  $\frac{48}{5} + 270\sqrt{2}$

32. (1 point) Express  $-7\sqrt{6}(-6\sqrt{5} - 2\sqrt{6})$  in simplest form.

- A  $14\sqrt{6} + 42\sqrt{30} + 84$   
 B  $252$   
 C  $42\sqrt{30} + 84$   
 D  $1260 + 14\sqrt{6}$

33. (1 point) Find a simplified expression for the area of this shape.

$A = 8w$

Diagram: A rectangle with a smaller rectangle attached to its right side. The top side of the rectangle is labeled  $(3\sqrt{7} + 4\sqrt{2})$ . The right side of the rectangle is labeled  $(3\sqrt{7} - 4\sqrt{2})$ . The bottom side is labeled  $9(7) - 16(2)$ .

- A  $9\sqrt{7} + 16\sqrt{2}$   
 B  $9\sqrt{7} - 16\sqrt{2}$   
 C  $95$   
 D  $91$

34. (1 point) Express  $\frac{2\sqrt{21} - 3\sqrt{7} + 4\sqrt{3} - 8}{\sqrt{7}} + \frac{\sqrt{4}}{4\sqrt{3} - 8}$  in simplest form.

- A  $6\sqrt{3} - 5$   
 B  $6\sqrt{21} - 14\sqrt{7}$   
 C  $\sqrt{3} - 7$   
 D  $2\sqrt{21} - 3\sqrt{7} + 4\sqrt{3} - 2$

$$\frac{2\sqrt{3} - 3 + 4\sqrt{3} - 8}{2} = 2\sqrt{3} - 3 + 2\sqrt{3} - 4 = 4\sqrt{3} - 7$$

- A  $x = \frac{16}{121}$   
 B  $x = \frac{16}{11}$   
 C  $x = \frac{4}{121}$   
 D  $x = \frac{4}{11}$

$$\sqrt{4x} = 11$$

$$4x = 121$$

$$x = \frac{121}{4}$$

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$$\sqrt{6x+1} = \sqrt{7x+7}$$

$$6x+2\sqrt{6x+1} = 7x+7$$

$$2\sqrt{6x+1} = x+6$$

$$4(6x) = x^2 + 12x + 36$$

36. (1 point) Solve  $\sqrt{6x+7} = \sqrt{7x+7} + 6$ .

- A  $x = -6$   
 B  $x = 24$   
 C  $x = 6$   
 D  $x = 12$

37. (1 point) The non-permissible value(s) for the rational expressions  $\frac{x^2-4}{12}$  is (are)

- A  $x = 2, x = -2$   
 B  $x = 2\sqrt{3}$   
 C  $x = 2$   
 D  $x = 4$

38. (1 point) What is  $\frac{5(4x^2 - y^2)}{2x^2 - 15xy - 8y^2}$  in simplest form? State any non-permissible values.

- A  $\frac{5(2x+y)}{x-8y}, x \neq -\frac{2}{y}, x \neq 8y$   
 B  $\frac{5(2x+y)}{x+8y}, x \neq -\frac{2}{y}, x \neq -8y$   
 C  $\frac{5(2x-y)}{x+8y}, x \neq \frac{2}{y}, x \neq -8y$   
 D  $\frac{5(2x-y)}{x-8y}, x \neq -\frac{2}{y}, x \neq 8y$

39. (1 point) What is the simplified version of the rational expression  $\frac{-3x+12}{32-8x}$

- A  $\frac{8}{3}(x-4)$   
 B  $x-4$   
 C  $\frac{8}{3}$   
 D  $-\frac{8}{3}$

40. (1 point) When fully simplified, ignoring non-permissible values,  $\frac{12x^{12}}{4x^3} + \frac{24x^6}{x^5}$  is equal to

- A  $72x^3$   
 B  $\frac{72}{x^3}$   
 C  $\frac{72}{x^3}$   
 D  $72x^3$

$$3x^9 \div x^2 = \frac{3x^9}{x^2} = 3x^7$$

$$\frac{6a^4b^7}{9a^2b^2} \times \frac{a^8b^{14}}{27a^3b^{12}}$$

$$\frac{2a^2b^5}{3} \times \frac{a^5b^2}{27} = \frac{2a^7b^7}{81}$$

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41. (1 point) Simplify the rational expression  $\frac{6a^4b^7}{(3ab)^2} \times \frac{(a^4b^7)^2}{(3ab^4)^3}$ .

A  $\frac{2}{243}a^5b^7$

B  $\frac{2}{243}a^7b^7$

C  $\frac{2}{81}a^5b^7$

☒ D  $\frac{2}{81}a^7b^7$

42. (1 point) Express the quotient  $\frac{x^2-5x-24}{x^2-11x+24} \div \frac{2x^2+7x+3}{x^2+x-12}$  in simplest form.

A  $\frac{2x+1}{x+4}$

☒ B  $\frac{x+4}{2x+1}$

C  $\frac{(x+3)(2x+1)}{(x-3)(x+4)}$

D  $\frac{(x-3)(x+4)}{(x+3)(2x+1)}$

$$\frac{(x-8)(x+3)}{(x-8)(x+3)} \cdot \frac{(x+4)(x-3)}{(2x+1)(x+3)}$$

43. (1 point) When fully simplified, ignoring restrictions on the variable,  $\frac{6xy-8}{x^2y^2} + \frac{-3-7xy}{7xy}$  is equal to

A  $\frac{3xy-15}{7x^2y^2}$

☒ B  $\frac{-7x^2y^2+39xy-56}{7x^2y^2}$

C  $\frac{-7x^2y^2+39xy-56}{7x^2y^2}$

D  $\frac{-xy-11}{7x^2y^2}$

$$\frac{7(6xy-8)+xy(-3-7xy)}{7x^2y^2}$$

44. (1 point) When fully simplified, ignoring restrictions on the variable,  $\frac{x+8}{x^2+9x+20} + \frac{x+5}{x^2+7x+12}$  is equal to

A  $\frac{2x+13}{2x^2+16x+32}$

B  $\frac{(x+8)(x+5)}{(x^2+9x+20)(x^2+7x+12)}$

C  $\frac{2x^2-21x-49}{(x+5)(x+4)(x+3)}$

☒ D  $\frac{2x^2+21x+49}{(x+5)(x+4)(x+3)}$

$$\frac{x+8}{(x+4)(x+5)} + \frac{x+5}{(x+4)(x+3)}$$

$$\frac{2x^2+21x+49}{(x+3)(x+4)(x+5)}$$

$$(x+3)(x+4)(x+5)$$

$$\frac{x^2+11x+24+x^2+10x+25}{(x+3)(x+4)(x+5)}$$

$$(x+3)(x+4)(x+5)$$

$$(x-10)(x+1) \Rightarrow x^2-4x=4-x+6(x+1)$$

$$x^2-9x-10=0$$

$$x(x-4)=4-x+6(x+1)$$

$$x^2-4x=4-x+6x+6$$

$$x^2-9x-10=0$$

$$x=\cancel{10} \leftarrow$$

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45. (1 point) Solve the rational equation  $\left[ \frac{x}{x+1} = \frac{4-x}{x^2-3x-4} + \frac{6}{x-4} \right]$

A  $x=10$

B  $x=4$  and  $-1$

C  $x=-10$

D  $x=-10$  and  $1$

46. (1 point) Determine the value of the absolute value expression  $\frac{-7-|-7^3-(-6)|}{-2}$

A  $\frac{2443}{2}$

B  $\frac{2443}{2}$

☒ C  $172$

D  $-172$

$$\frac{-7-|-343+6|}{-2}$$

$$\frac{-7-337}{-2}$$

$$\frac{42x^2y-56-3x^2y-7x^2y^2}{7x^2y^2}$$

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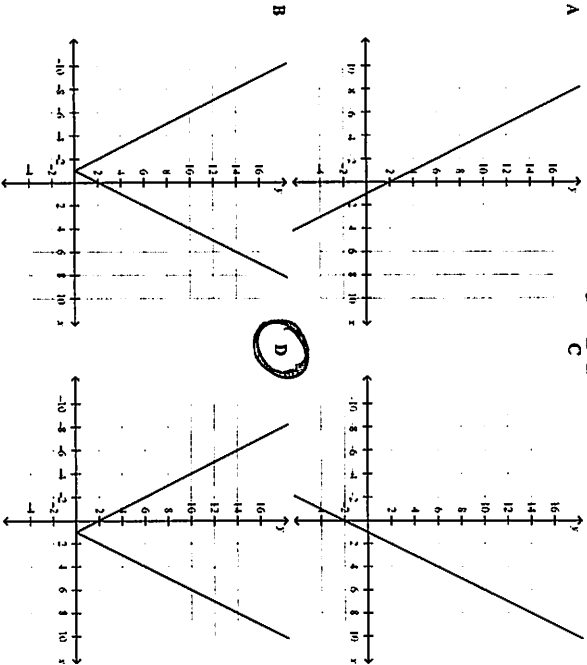
$$-2x + 2 \geq 0$$

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**D** 47. (1 point) The graph of  $y = |-2x + 2|$  is

$$-2x \geq -2$$

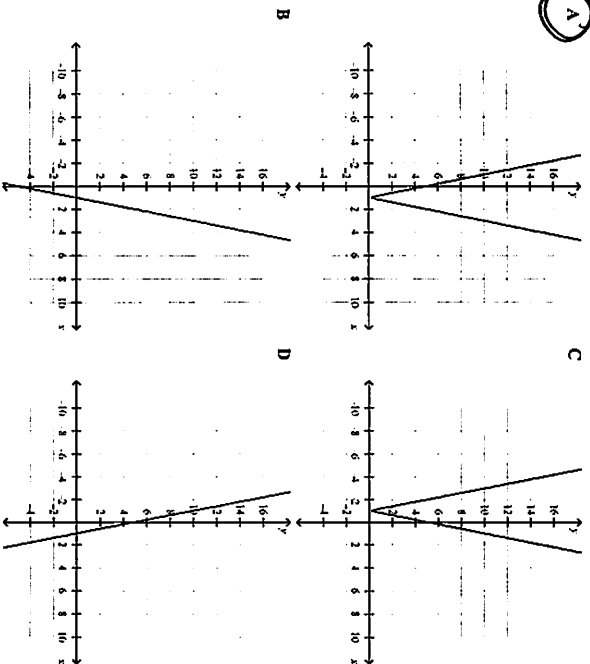
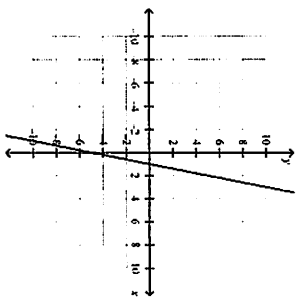
$$x \leq 1$$



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**A** 48. (1 point) Given the graph of  $y = f(x)$ , which is the graph of  $y = |f(x)|$ ?

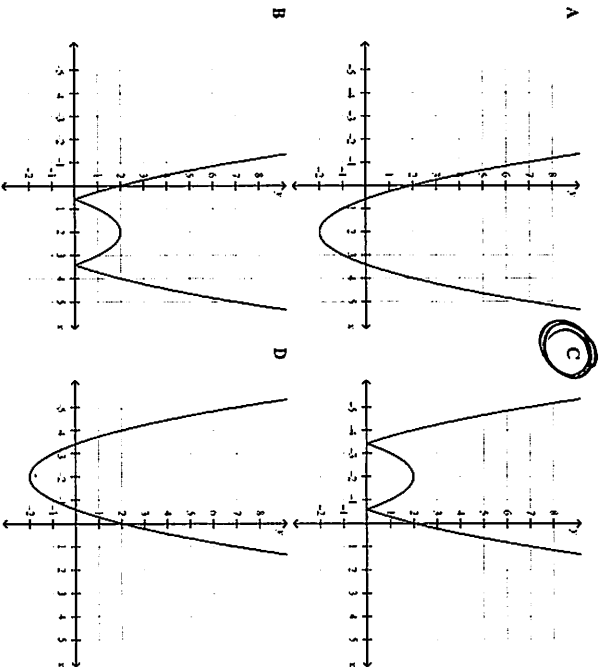


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$$\sqrt{(-2, -2)}$$

C 49. (1 point) The graph of  $y = |(x+2)^2 - 2|$  is



A 50. (1 point) Determine the solution to  $|6x+9|+2=8$ .

- A  $x = -\frac{1}{2}$  or  $x = -\frac{5}{2}$   
 B no solution

- C  $x = \frac{1}{2}$  or  $x = \frac{5}{2}$   
 D  $x = \frac{3}{2}$

$$|6x+9| = 6$$

$$6x+9=6$$

$$6x = -3$$

$$x = -\frac{1}{2}$$

$$6x+9=-6$$

$$6x = -15$$

$$x = -\frac{5}{2}$$

Name: \_\_\_\_\_

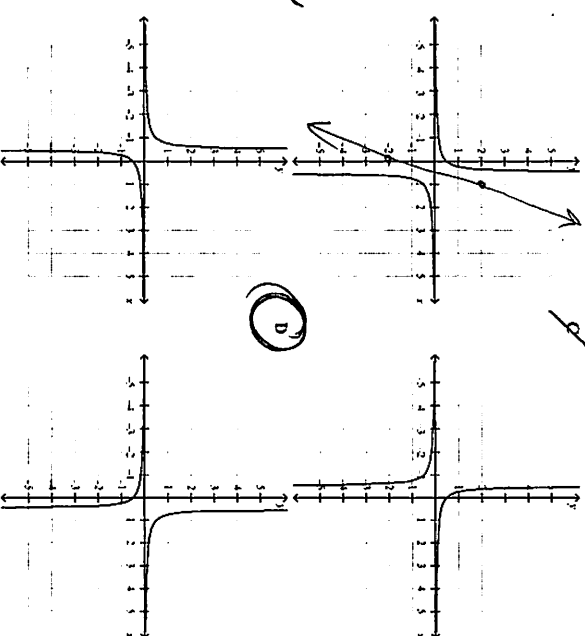
ID: A

D 51. (1 point) What is the solution to  $|4x+8| = -8x+3$ ?

- A  $x = -\frac{5}{12}$  or  $x = \frac{11}{4}$   
 B  $x = \frac{5}{12}$  or  $x = -\frac{11}{4}$

- C  $x = \frac{5}{12}$  or  $x = -\frac{11}{4}$   
 D  $x = -\frac{5}{12}$  or  $x = \frac{11}{4}$

D 52. (1 point) Which graph represents the reciprocal of the linear function  $y = 4x - 2$ ?



$$4x+8 = -8x+3$$

$$12x = -5$$

$$x = -\frac{5}{12}$$

$$-4x-8 = -8x+3$$

$$4x = 11$$

$$x = \frac{11}{4}$$

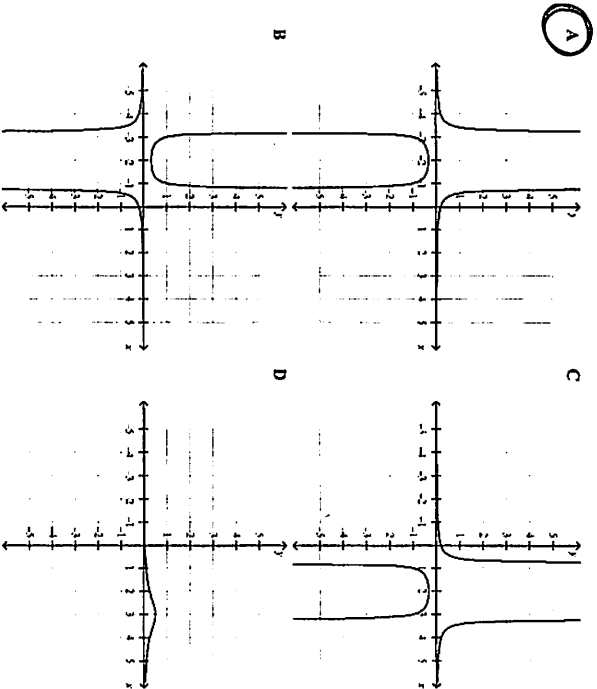
$$y = \frac{1}{4x-2}$$

Name: \_\_\_\_\_

$$\sqrt{(-2, -3)}$$

ID: A

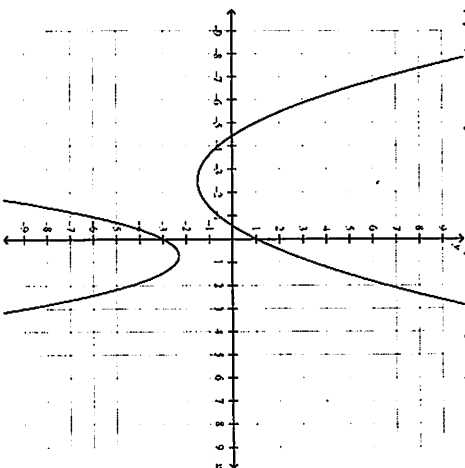
53. (1 point) Which graph represents the reciprocal of  $y = 2(x+2)^2 - 3$ ?



Name: \_\_\_\_\_

ID: A

55. (1 point) How many solutions are represented by the graph shown below?



A two solutions  
B one solution

C three solutions  
D no real solution

54. (1 point) The equation of the vertical asymptote for the reciprocal of  $y = 8x - 4$  is

- A  $x = -\frac{1}{2}$   
B  $x = 2$

- C  $x = \frac{1}{2}$   
D  $x = -2$

$$0 = 8x - 4$$

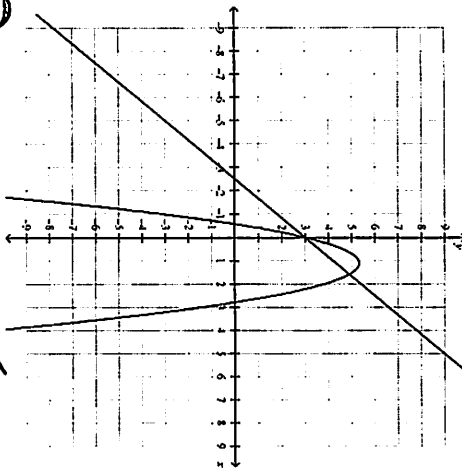
$$4 = 8x$$

$$\frac{1}{2} = x$$

Name: \_\_\_\_\_

ID: A

56. (1 point) What system of equations is represented by the following graph?



- ☒ A  $y = 1.2x + 3$   
 $y = -1.9x^2 + 4.2x + 3$   
 $y = -1.9x - 3$   
 $y = 1.2x^2 + 4.2x + 3$
- ☐ B  $y = -1.2x + 3$   
 $y = 1.9x^2 + 4.2x + 3$   
 $y = -1.2x + 3$   
 $y = 1.9x^2 - 4.2x + 3$

57. (1 point) The line  $y = 9x - 4$  intersects the quadratic function  $y = x^2 + 7x - 3$  at one point. What are the coordinates of the point of intersection?

- ☒ A  $(0, 0)$   
☐ B  $(1, -5)$   
☐ C  $(-1, 5)$   
☐ D  $(1, 5)$

$$9x - 4 = x^2 + 7x - 3$$

$$0 = x^2 - 2x + 1$$

$$0 = (x - 1)^2 \quad x = 1$$

19

$$y = 9(1) - 4 = 5$$

Name: \_\_\_\_\_

ID: A

58. (1 point) Solve the following system:

$$y = -6x + 9$$

$$y = -8x^2 - 0x + 9$$

☐ A  $(-\frac{3}{2}, -\frac{27}{2})$   
☐ B  $(0, \frac{27}{8})$  and  $(\frac{3}{8}, \frac{9}{8})$

$$-6x + 9 = -8x^2 - 9x + 9$$

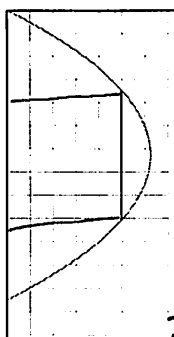
$$8x^2 + 3x = 0$$

$$x(8x + 3) = 0$$

$$x = 0, -\frac{3}{8}$$

59. (1 point) The cross-section of a tunnel is in the shape of a parabola. The parabolic shape of the tunnel is given by the function  $y = -\frac{1}{7}x^2 + 6x$ . What is the width of the tunnel, to the nearest hundredth of a meter, at a height of 47.25 m?

Diagram not to scale.



- ☐ A 63.00 m  
☐ B 47.25 m  
☒ C 21.00 m  
☐ D 31.50 m

$$47.25 = -\frac{1}{7}x^2 + 6x$$

$$\frac{1}{7}x^2 - 6x + 47.25 = 0$$

$$x = 6 \pm \sqrt{36 - 4(1/7)(47.25)}$$

60. (1 point) What are the solutions for the following system of equations?

$$y = -2x^2 - 9x - 4$$

$$y = 2x^2 - 5x - 4$$

☒ A  $(-1, 3)$  and  $(0, -4)$   
☐ B  $(1, -3)$  and  $(0, -4)$   
☐ C  $(1, 3)$  and  $(0, -4)$   
☐ D  $(1, -3)$  and  $(0, 4)$

$$x = 6 \pm 3$$

$$2/7$$

$$-2x^2 - 9x - 4 = 2x^2 - 5x - 4$$

$$x = 31.5, 10.5$$

$$4x^2 + 4x = 0$$

$$4x(x + 1) = 0$$

$$31.5 - 10.5$$

$$x = 0, -1$$

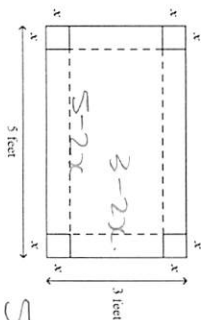
$$w = 21$$

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Name: \_\_\_\_\_

ID: A

Four corners are cut from a rectangular piece of cardboard that measures 5 ft by 3 ft. The cuts are  $x$  feet from the corners, as shown in the figure below. After the cuts are made, the sides of the rectangle are folded to form an open box. The area of the bottom of the box is 12 ft<sup>2</sup>.



$$3 - 2(0.2) = 2.6$$

$$5 - 2(0.2) = 4.6$$

Diagram not drawn to scale

61. (1 point) What two equations represent the area,  $A$ , of the bottom of the box?  $(5 - 2x)(3 - 2x)$

☒ A  $A = 4x^2 - 16x + 15$

$A = 12$

B  $A = 4x^2 + 15$

$A = 12$

C  $A = 4x^2 + 15$

$A = 8$

D  $A = 4x^2 - 30x + 8$

$A = 8$

$$15 - 16x + 4x^2$$

62. (1 point) What are the approximate dimensions of the box? Give your answer to one decimal place.

A width = 2.6 ft

length = 4.6 ft

height = 3.8 ft

B width = 4.0 ft

length = 2.0 ft

height = 0.5 ft

C width = 4.8 ft

length = 2.8 ft

height = 0.1 ft

D width = 4.6 ft

length = 2.6 ft

height = 0.2 ft

$$4x^2 - 16x + 15 = 12$$

$$4x^2 - 16x + 3 = 0$$

$$x = 16 \pm \sqrt{256 - 4(4)(3)}$$

$$2(4)$$

63. (1 point) What is the approximate volume of the box? Give your answer to one decimal place.

A 1.4 ft<sup>3</sup>

B 4.0 ft<sup>3</sup>

C 2.4 ft<sup>3</sup>

D 45.6 ft<sup>3</sup>

$$12(0.2) = 2.4$$

$$x = 16 \pm \sqrt{208}$$

$$8$$

$$x = 8.8$$

$$x = 0.2$$

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Name: \_\_\_\_\_

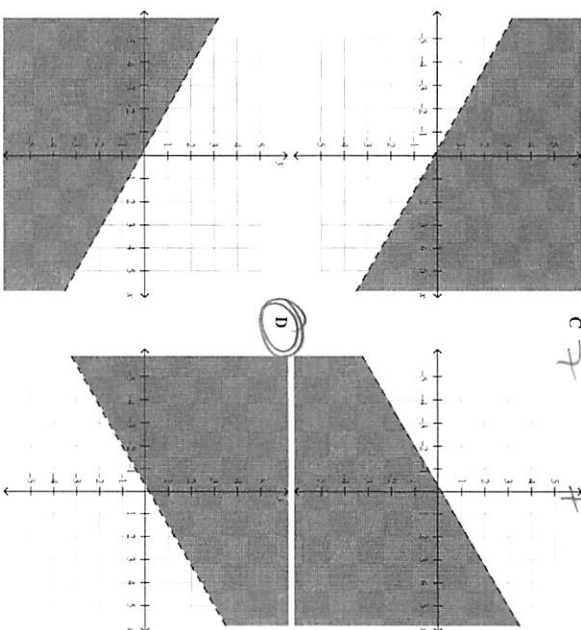
ID: A

64. (1 point) The graph of  $-4x + 7y > 1$  is

$$y > \frac{4}{7}x + \frac{1}{7}$$

C

D

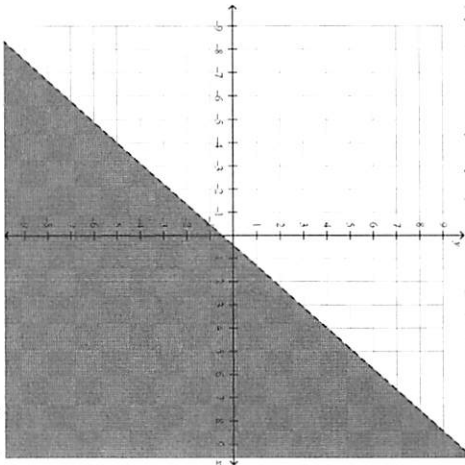


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Name: \_\_\_\_\_

ID: A

65. (1 point) Which inequality represents the graph shown below?



☒ A  $y > \frac{8}{9}x - 2$

☐ B  $y < \frac{8}{9}x - 2$

☒ C  $y > \frac{9}{8}x - \frac{1}{2}$

☐ D  $y < \frac{9}{8}x - \frac{1}{2}$

A sports store makes a profit of \$50 on every pair of cross-country skis sold and \$125 on every set of snowshoes sold. The manager's goal is to have a profit of at least \$700 a day from the sales of these two items.

66. (1 point) If  $x$  represents the number of pairs of cross-country skis sold and  $y$  represents the number of pairs of snowshoes sold, what inequality models the combinations of ski and snowshoe sales that will meet or exceed the daily profit goal?

☐ A  $50x + 125y \leq 700$

☒ B  $50x + 125y > 700$

☒ C  $50x + 125y \geq 700$

☐ D  $50x - 125y < 700$

$$50x + 125y \geq 700$$

$$125 - \frac{50x + 700}{125}$$

$$125 - \frac{2}{5}x + \frac{28}{5}$$

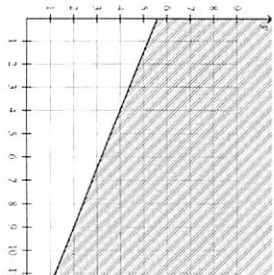
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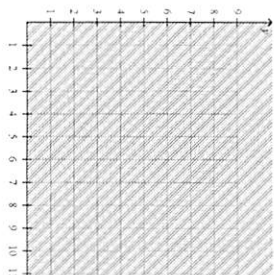
ID: A

67. (1 point) Which graph represents the combinations of ski and snowshoe sales that will meet or exceed this daily sales goal?

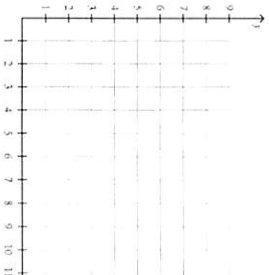
☒ A



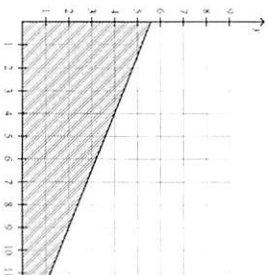
C



B



D

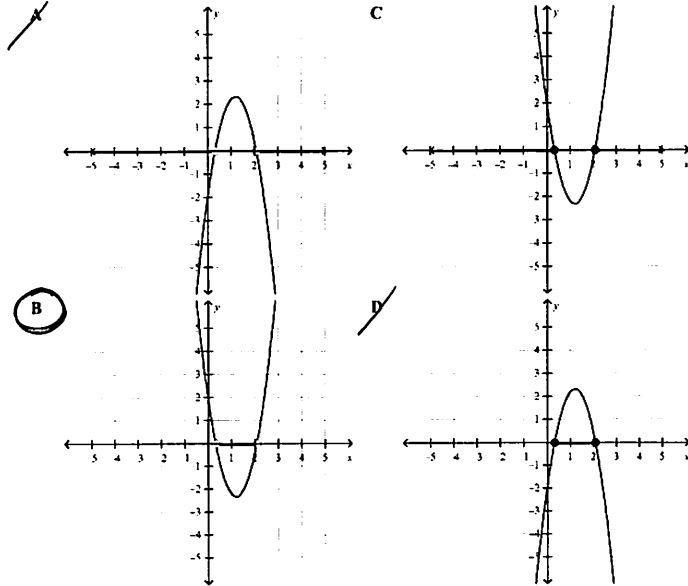


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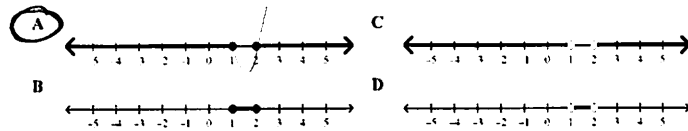
Name: \_\_\_\_\_

ID: A

B 68. (1 point) Which graph represents the solution to the inequality  $3x^2 - 7.2x + 2 < 0$ ?



A 69. (1 point) Which graph represents the solution to the inequality  $2x^2 - 6x + 4 \geq 0$ ?

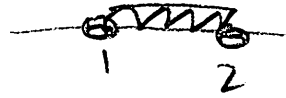


Name: \_\_\_\_\_

ID: A

A 70. (1 point) The solution set to the inequality  $-3x^2 \leq -9x + 6$  is

- ☒ A  $\{x \mid 1 \leq x \leq 2, x \in \mathbb{R}\}$ 
☐ B  $\{x \mid -2 \leq x \leq -1, x \in \mathbb{R}\}$ 
☐ C  $\{x \mid x \leq -2 \text{ or } x \geq -1, x \in \mathbb{R}\}$ 
☐ D  $\{x \mid x \leq 1 \text{ or } x \geq 2, x \in \mathbb{R}\}$



800 people will attend a concert if tickets cost \$20 each. Attendance will decrease by 30 people for each \$1 increase in the price. The concert promoters need to make a minimum of \$12 800.

C 71. (1 point) What quadratic inequality represents this situation?

☐ A  $(800 + x)(20 - 30x) \leq 12 800$ 
☒ B  $(800 + x)(20 - 30x) \geq 12 800$ 
☐ C  $(20 + x)(800 - 30x) \geq 12 800$ 
☐ D  $(20 - x)(800 + 30x) \leq 12 800$

C 72. (1 point) What is the range of ticket prices the concert promoters can charge and still make at least the minimum amount of money desired?

- ☐ A  $\$27.52 \leq \text{ticket price} \leq \$5.81$ 
☒ B  $\$12.48 \leq \text{ticket price} \leq \$34.19$ 
☐ C ticket price  $\leq \$12.48$ 
☐ D ticket price  $\geq \$34.19$

$$16000 + 800x - 600x - 30x^2 \geq 12800$$

$$0 \geq 30x^2 - 200x - 3200$$

$$0 \geq 3x^2 - 20x - 320$$

$$x = \frac{20 \pm \sqrt{400 - 4(3(-320))}}{2(3)}$$

$$2(3)$$

$$= \frac{20 \pm \sqrt{4240}}{6}$$

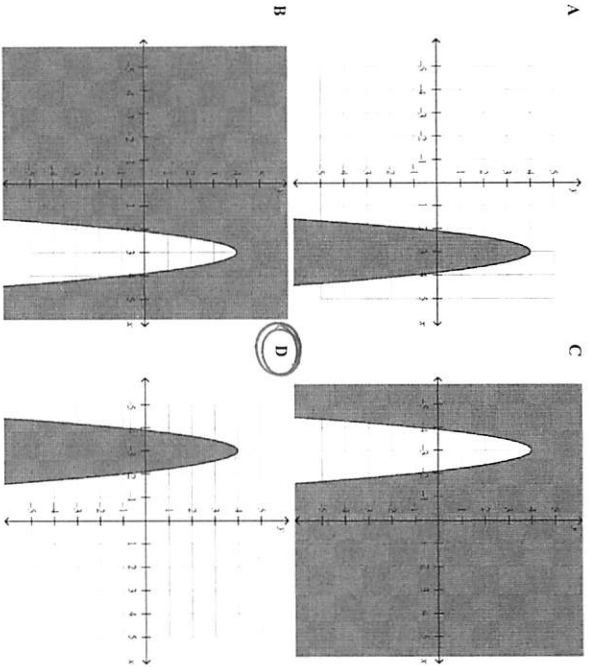
$$= 14.19$$

price = \$34.19, \$12.48

Name: \_\_\_\_\_

$V(-3, 4)$  ID: A

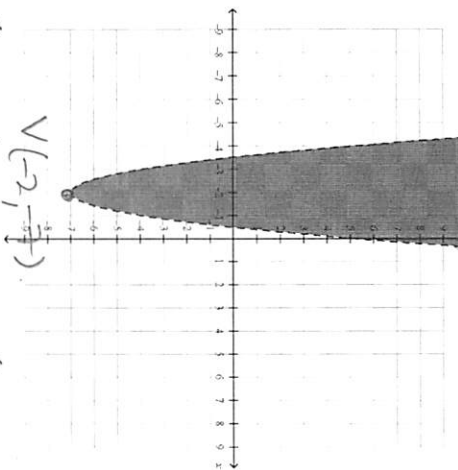
D 73. (1 point) Which graph represents the solution to the inequality  $y \leq -5(x+3)^2 + 4$ ?



Name: \_\_\_\_\_

ID: A

B 74. (1 point) Which quadratic inequality is represented by the graph shown below?



~~A~~  $y > -3(x+2)^2 - 7$   
B  $y > 3(x+2)^2 - 7$

~~C~~  $y > -3(x-7)^2 - 2$   
~~D~~  $y < 3(x-7)^2 - 2$